REMARKS

This application has been carefully reviewed in light of the Office Action dated June 17, 2008. Claims 13 to 20 are now pending in the application, with Claims 18 to 20 having been added herein. Claims 13, 17, 19 and 20 are the independent claims. Reconsideration and further examination are respectfully requested.

Claims 13, 16 and 17 were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 5,384,715 (Lytton), and Claims 14 and 15 were rejected under 35 U.S.C. § 103(a) over Lytton in view of U.S. Patent No. 5,086,279 (Wochnowski). Reconsideration and withdrawal of the rejections are respectfully requested.

The present invention concerns a system or method for counting the number of layers of a multilayer object. Specifically, the present invention concerns counting the number of layers of a multilayer object by oscillating an electromagnetic wave pulse to irradiate either a top surface or a bottom surface of the multilayer object, and receiving electromagnetic wave pulses reflected at interfaces of the layers of the multilayer object. A temporal waveform is used for counting the number of pulses, and the number of layers of the multilayer object is counted based on the counted number of pulses. According to one aspect of the invention, an output value of the reflected electromagnetic wave pulses is temporally sampled at every split time to obtain the temporal waveform of the reflected electromagnetic wave pulses. The split time is shorter than a pulse width of the temporal waveform.

By virtue of this arrangement, it is possible to obtain a time waveform to count a number of layers of a multilayer object even if a frequency of an oscillated electromagnetic wave is in a range of 30 GHz to 100 THz.

Referring specifically to claim language, independent Claim 13 is directed to a system for counting the number of layers of a multilayer object. The system comprises an oscillation unit for oscillating an electromagnetic wave pulse having a frequency in a range from 30 GHz to 100 THz to irradiate either a top surface or a bottom surface of the multilayer object. The system further includes a reception unit for receiving electromagnetic wave pulses reflected at interfaces of the layers of the multilayer object. The system also includes a processing unit for temporally sampling an output value of the reflected electromagnetic wave pulses at every split time to obtain a temporal waveform of the reflected electromagnetic wave pulses, the split time being shorter than a pulse width of the temporal waveform. The temporal waveform is used for counting the number of pulses, and the number of layers of the multilayer object is counted on the basis of the counted number of pulses.

Claim 17 is a method claim that substantially corresponds to Claim 13.

Newly-added independent Claim 19 is directed to a system for counting the number of layers of a multilayer object. The system includes an oscillation unit for oscillating an electromagnetic wave pulse having a frequency in a range from 30 GHz to 100 THz to irradiate either a top surface or a bottom surface of the multilayer object, and a reception unit for receiving an output value of electromagnetic wave pulses reflected at interfaces of the layers of the multilayer object. The system further includes a processing unit for counting the number of layers of the multilayer object on the basis of the number of pulses which is counted by using a temporal waveform of the reflected electromagnetic wave pulses. The reception unit temporally samples output values of the reflected electromagnetic wave pulses at every split time, the split time being shorter than a pulse

width of the temporal waveform. The processing unit obtains the temporal waveform by using the output values.

Newly-added independent Claim 20 is a method claim that substantially corresponds to Claim 19.

The applied art, alone or in any permissible combination, is not seen to disclose or to suggest the features of Claims 13, 17, 19 and 20, and in particular, is not seen to disclose or to suggest at least the features of temporally sampling an output value of reflected electromagnetic wave pulses at every split time to obtain a temporal waveform of the reflected electromagnetic wave pulses, the split time being shorter than a pulse width of the temporal waveform.

Lytton is seen to disclose a system used to obtain digitized images of a reflected radar signal from a multilayer system. In Lytton, standard mathematical techniques are applied to these images to determine a number of layers, a thickness of each layer, and a dielectric constant for each layer within the multilayer system. (See Abstract of Lytton). Moreover, the accuracy of the system of Lytton is a function of the quality of stored reflected radar signals. In this regard, the sample rate of the system's receiver or signal processor needs to be sufficiently high that a high resolution representation of the signal is made. This requirement is driven by the well-known sampling theory of Nyquist. (See column 9, lines 40 to 46 of Lytton). Page 3 of the Office Action adds that a sampling rate of 1/(2*frequency) is taught by the Nyquist sampling theorem. Thus, Lytton is seen to disclose using the sampling rate 1/(2*frequency) of the Nyquist sampling theorem in order to make a high resolution representation of the reflected signal. In contrast, in the present invention, a temporal waveform of electromagnetic wave pulses is obtained by temporally

sampling an output value of the reflected electromagnetic wave pulses at every split time, the split time being shorter than a pulse width of the temporal waveform. Thus, the Nyquist sampling theorem as used in Lytton is seen to be different than the temporal sampling of the present invention which is used to create a temporal waveform of the reflected electromagnetic wave pulses.

Wochnowski is not seen to cure the above described deficiencies of Lytton. Wochnowski is merely seen to disclose measuring the moisture content of certain commodities using a source of electrical energy and a monitoring device. However, Wochnowski is not seen to add anything that, when combined with Lytton, would have resulted in at least the features of temporally sampling an output value of reflected electromagnetic wave pulses at every split time to obtain a temporal waveform of the reflected electromagnetic wave pulses, the split time being shorter than a pulse width of the temporal waveform.

Accordingly, independent Claims 13, 17, 19 and 20 are believed to be allowable.

The other pending claims in the application are each dependent from the independent claims discussed above and are believed to be allowable over the applied references for at least the same reasons. Because each dependent claim is deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

No other matters having been raised, the entire application is believed to be in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience.

Applicants' undersigned attorney may be reached in our Costa Mesa, California office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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